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The Michigan Antique Radio Chronicle

A QUARTERLY WRITTEN FORUM OF THE MICHIGAN ANTIQUE RADIO CLUB

VOLUME 32 Spring 2017 NUMBER 1

MARC Your Calendar!

Vintage Electronics EXTRAVAGANZA '17

July 13-15, 2017 in Kalamazoo

See Jeff Lilly's *Perspectives* column on page 3 for important changes to this year's auction.

THE MICHIGAN ANTIQUE RADIO CLUB

The Michigan Antique Radio Club was founded October 19, 1985 at the Dillon Inn in Lansing, Michigan. Present at this historical meeting to found MARC were Jim and Brenda Clark, Larry Anderson, Karl Rommel, Mike Male, Dick Perry and John Kent. The purpose of the organization is to preserve the history and enhance the knowledge of radio, television, and related disciplines, with special emphasis on contributions originating in the state of Michigan. Dues for membership in M.A.R.C. are $25.00 annually (US funds) and payable in January. Officers of M.A.R.C. welcome your membership, your questions and your personal contributions to enhance the service value, growth and activities of the organization. Terms of office for Board members expire concurrently with the summer EXTRAVAGANZA meet held in Kalamazoo, Michigan. Send Correspondence to MARC, 311 Wordsworth St., Ferndale, MI 48220. E-mail: president@michiganantiqueradio.org. **Visit our Web site at** www.michiganantiqueradio.org.

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The 2017 Early Television Convention will be held May 5-7 at the museum in Hilliard, OH. Check out their website for details: http://www.earlytelevision.org.

Perspectives

Winter is finally behind us, we've sprung forward and are watching the first flowers poke up and the trees start to bud. In this time of renewal and new beginnings, it might be a good time to tell you about EXTRAVAGANZA, 2017 edition... and a few new things we're trying this time around.

Enclosed with this issue, you'll find the '17 flyer with all the info. We are once again at the fabulous Kalamazoo Expo Center, all-indoors, in air-conditioned comfort. Please feel free to copy and distribute the flyer as widely as you wish. Its word-of-mouth from our members that's a big part of getting people to come to the show.

And what a show it will be! Our theme is Mid-Century Modern. Bright colors, clean lines, informed by industry and technology, from the end of the Depression to the dawn of the Space Age. Check out our contest categories and enter your best example of the pushbutton future in our Open!

We have some great presentations lined up this year. Thursday evening, former MARC president John Reinicke will present "The Hallicrafters Project." Friday morning, Mike Sheppard, owner of Northern TV and Vacuum in Madison Heights, MI, will reflect on 77 years of his shop's existence with a lot of humor, anecdotes, and some door prizes as well. Saturday morning, Craig Cianciolo will get down to the grain, talking about wood radio cabinet care and restoration. Craig is a graduate of Dakota County Technical College's National Institute of Wood Finishing, and worked in the U.S. Capitol for many years, conserving presidential and congressional treasures.

Friday is our main auction, and we're experimenting with a new approach. There's now a reserve system in place, with no buy-backs. This will hopefully give sellers new peace of mind when placing items in the auction. There's a $5 entry fee per item, plus a 10% commission to MARC if your item sells, whichever is greater. You must be registered in order to buy or sell in the auction. Taking over the auctioneer's duties this year is none other than our own Dan Gutowski. I look forward to hearing your feedback and constructive criticism on the changes. Hold on a moment, let me get my helmet...

Saturday, we are featuring not one, but two silent auctions. Response last year was so overwhelming that we decided to spread things out a bit. There's a more frantic pace this year, too, with one hour of bid time per silent auction. Check the schedule for details.

The end of the show will once again feature our great big Bargain Auction, aka the "Good Buy Affair." Grab those last-minute deals and steals before heading home to enjoy your new haul of treasures!

We look forward to seeing you in Kalamazoo, MI this July 13-15. I wish you all safe travels, good sales, and happy bargain hunting!

Jeff

NOTES FROM THE SERVICE SHOP

No. 97

by John Reinicke

Sounds, Heard and Otherwise

© 2017 by John Reinicke

Egad, the attic was cold! My old scout leader always said, "If your feet and hands are cold, put on a warm hat." Since we radiate so much heat from the top of our heads, particularly if you are folicly impaired (think thin hair) like me, this is good advice. Today I had heeded his advice and was wearing a warm knit cap and a heavy sweater. The brilliant winter sun was pouring in the front window and I had hope that the sun's warmth combined with the hot cup of Betty's robust coffee would soon take the edge off the chill.

This morning found me in the attic of Ken and Betty's antique shop in Centerburg. I had driven down the night before and had enjoyed a pleasant visit with Ken and Betty this morning before retreating to the attic to read from the diary and log book of Clemens Mettmann the proprietor of the Centerburg Radio and TV shop that had occupied the building in decades long past. I leaned back in the chair at the roll top desk and stepped back in time to the decade after the end of WW II.

Gerry was running late, and he knew it. He had been up in the middle of the night after the on-duty deputy had called him to report a problem with the Sheriff's base station. The call came at about 2:30 and he was in the radio shack at the top of the hill before three. As he entered the door just off the alley he was thinking that it was such a short walk from home that it had taken him longer to get his car out of the garage than the walk would have taken. However, had he walked, he would have to carry a rather heavy set of tools and a tube caddy. The radio shack was located at the base of the tower for the Centerburg Police and County Sheriff's two-way radios. The dispatcher office was at the base of the hill in the county building. Stepping into the building he appreciated the warmth. With his key out, he opened the door of the base station and was relieved to find an "aired" tube in the receiver in no time at all. (The term "aired" refers to a tube that has cracked or, more usually, has a failed seal around one of the pins. Outside air fills the tube and turns the silver of the getter to an unmistakable white powder.) He replaced the tube and the receiver came back to life. Normally, when he replaced a tube, he would touch

up alignment. He knew all of the radios in the shack were due for their monthly check-up in a couple of days, so he figured the alignment could wait. A call to the dispatcher confirmed that all was OK, so all that remained was to lock up and return home.

The whole operation had taken only a bit over an hour, but after getting up at that hour, it had taken Gerry a while to get back to sleep. Therefore, it was not a surprise that Gerry had overslept a bit on that chilly morning. Even with the late start, Gerry managed to walk in the back of the shop before opening. It just happened to be later than his usual entry. As he hung up his coat, his nose told him that, at least, he would not have to wait on the coffee pot to finish. Gerry filled his cup with the much-needed coffee and turned to go to his bench.

He did not expect what he saw and the expression on his face clearly reflected his surprise. Art and Clem had watched his entry, both had noted the "fog" in his appearance, and were smiling.

"Up late last night?" Clem asked with a chuckle.

Gerry responded, "Nope, up early this morning." As he related the story of the base station repair, he took in the scene before him. Next to Clem's bench was a rather sizable parabolic dish mounted on a sturdy tripod. The dish was painted in camouflage colors and it appeared to have a microphone mounted at the focal point. What was clearly a tape recorder sat on Clem's bench. Another parabolic dish stood next to Art's bench. Art's dish was still painted in the military olive drab and was mounted on an obviously homebrew tripod. Again, what appeared to be a microphone was mounted at the focal point with a wire running down to a chassis that appeared to be from an older table radio.

Gerry stood and looked slowly from dish to dish and both Clem and Art could "see the wheels turning" in his head. After a few seconds, he finally asked, "OK, I can see there must be a story here and I sure would like to know what it might be."

Art was the first to respond as he waved to Clem. "You first, boss. Age before beauty after all."

Clem smiled and responded with a low grumble, "Beauty was a horse." He then continued, clearly eager to share, "The dish and tape recorder belong to Professor Kellogg over at the University. The good Professor has made quite a career out of recording sounds of nature. Some time ago, he decided that, just as it is interesting to "shoot" game with a camera, it would be interesting to capture the sounds of nature in high fidelity as well. It has only been since the war that recording equipment has gotten small enough to drag into the field and tape recording is certainly preferable to disk recording.

"The good professor got the start of his interest during the war. He had been a radar and sound expert and used that skill to capture hours and hours of jungle sounds. The army used those sounds to train jittery GI's that the sound of a Howler Monkey shouldn't scare a mouse much less them. More importantly, they could "show" those GI's the sounds of rain on the leaves were different than a Japaneese prowler making his way through the jungle. I expect the Doc's training sounds saved more than one of our GI's as they made their way across the Pacific.

"Since the war, he and a fellow professor have been literally all over the world capturing wildlife in color photos and sound. He has also accumulated an

extensive library of recorded sounds that have found quite a number of commercial applications. As an example, if you play the sound of a hungry pig's squeal it will wake up little pigs and make them take on food, thus making them gain weight faster. He even recorded the sound of a moth larva chewing through a wool sock. That was used for a radio commercial for moth repellent.

"But his real passion is collecting bird calls and that is where this dish and recorder comes in. The dish is a war surplus radar reflector with the microphone mounted at the focus. A number of his colleges said it wouldn't work, but he discovered it worked quite well. A dish this size isn't effective below 300 cycles because of the wavelength of sounds below that frequency. That means it wouldn't help with a bear or lion's roar but for birdcalls, it is quite effective. Not only does it help pick up the bird, it tends to block surrounding noises like leaves rustling for example.

"He uses a dynamic microphone because it is quite rugged, has wide frequency response and a low impedance output so the cable can be fairly long. When he first started making these recordings, he took out the back seat of his car and converted it into a recording studio. Four car batteries and a converter in the trunk provide power. In his work, if he can't get a clear recording, sometimes he will make a test recording and then play it back for his subject. When the bird hears what he thinks is another bird in his territory he will come charging in quite close and quite vocally challenge the "intruder", thus giving the professor the clear recording he desired.

"With his car recording studio, the microphone has to be within 500 feet of the car since that is just about a long as the cable can be for a good recording. Although this works quite well and enabled him to get a large number of good recordings it can be limiting because roads don't always go where he wants to record. And that brings us to this recorder." Clem pointed to the unit on his bench. "This recorder uses a flyball governed clockwork mechanism to move the tape at 15 inches per second. You can see the big flywheel on the capstan to insure constant speed. This recorder has a very impressive 50 to 15000 cps frequency response and small flashlight batteries provide power for the amplifier for 100 hours. The recorder weighs in at 17 pounds. That combined with 13 pounds for the reflector and 8 pounds for the tripod makes for a very luggable 38 pounds. With this set up he can get quite some distance into the field for his re-

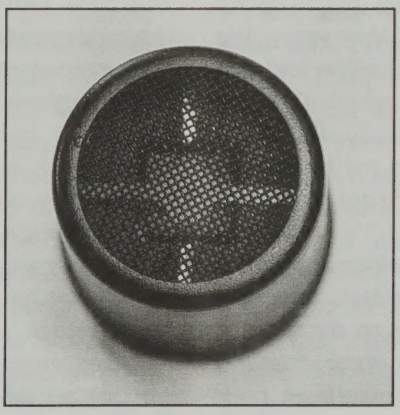
cordings."

Art and Gerry were clearly impressed and it was Gerry who asked, "That is all very interesting indeed. However, why is it here? I expect Professor Kellogg could do his own repairs."

"I have no doubt whatsoever that he could." Clem responded. "This time he has scheduled his next expedition and just didn't have time to deal with repairs so he dropped off the set up here. As it turns out, even high quality equipment can suffer from a shorted capacitor and I took care of that last night. I will give him a call later this morning to let him know it is ready to go. I must say that I am flattered that he trusted us with the repair."

Gerry turned to Art and pointed to the dish at his bench. "It looks to me that you got your dish at the same surplus store but your set up has a bit more of a "Rube Goldberg" flavor. I don't see a recorder, so what are you up to?"

Art walked over to his bench and you could hear pride as he explained his rig. "This is for the Science Fair at school. I know that we humans can hear upwards of 20 thousand cycles but there are a whole bunch of sounds that are higher in frequency. We all know that bats use sonar to navigate and find their prey after dark and they use frequencies beyond human hearing. I wondered if insects or other critters used high frequencies as well. I decided to find out. For an ultrasonic microphone I talked to our Zenith parts supplier and got one of the microphones they use in TV sets for that new remote control. It was kind of expensive, but not nearly so expensive as the one the professor uses. I decided that it would be interesting to hear those sounds. To do that, I figured I would need some way of translating the range of 20 to 40 Kilocycles down to a human range.



Ultrasonic Mike

"I spent some time at the library doing research on this. One way would be to use what is called a balanced mixer. A balanced mixer will take in two signals and output the sum and difference frequencies. If I were to combine, say 20 Kilocycles with the audio and if that were at 25 Kilocycles the output of the mixer would be at 45 Kilocycles, the sum, which I couldn't hear. It would also be at 5 Kilocycles, the difference, which I could hear. As I thought about it, it occurred to me that mixer in a table radio does just that and that is how a superhetrodyne works. So I thought if I were to rig the oscillator to run at around 435 Kilocycles then that would mix with 20 Kilocycles to make 455, the sum, and that would pass through the IF. I could remove the RF connection at the grid of the mixer and replace it with a 1-megohm resistor to ground. I could then capacitively couple the ultrasonic microphone to the grid. I did some experimenting, and on this set I found that a 680 micky-mike (slang for micro-micro Farad - picoFarad in today's language, Ed.) in parallel with the tuning capacitor would do the trick. The fact the tuning cap is still in the circuit enables me to tune around a bit as well."

Clem and Gerry both nodded in approval. Clem was pulling on one earlobe

as he responded, "That is actually quite clever. Does it actually work and what have you happened to hear?"

"Yea, it really does work. Of course I don't know exactly the frequency I am hearing but at least I can hear if it goes up or down in pitch. Anyway, I discovered that bats are pretty loud and their sonar is sort of a bird like chirp. I discovered that crickets make supersonic noises as well. I have heard some things I can't identify. There are a bunch of noises that I didn't expect. For instance, if I point the microphone at my Uncle Ted's cigarettes as he smokes them, when he takes a drag it sounds like a forest fire. I discovered that a slow leak in my bike tire makes quite a whistle and the same is true for a small gas leak as well. I think those might be handy discoveries. I also listened to a TV remote control from the showroom. That sounds like a gong. I have tried listening to a car engine and so far that hasn't been particularly interesting. I suppose a failing bearing might sound off, but I haven't heard that yet. We have a radiant bathroom heater, and as it warms up the element emits a whole bunch of clicks, pops, and squeaks. It has been really interesting to see what I can hear and then try to figure out the significance of the sound."

Gerry was clearly thinking about possible uses for the new gadget. "I think I am going to have to talk to the folks at the phone company. I know that the phone company uses pressure on their cables. That way, if a crack in the lead opens up, or a squirrel chews a hole in the lead jacket, it will leak gas or air out rather than letting rain in. The insulation on the individual pairs is paper in a lot of cables and it really does need to stay dry. They know they have a leak in a cable when they start using gas. The trick is finding the hole in miles of cable. Usually they will localize the leak by checking pressure but I wonder if a portable version of your gadget would enable them to pin point the leak."

Gerry walked over to Art's bench to check it out. After a short discussion, Gerry retreated to the showroom to fetch a remote controller. He got a large grin as he noted that it did, indeed, sound rather like a gong. Clem could also hear the demonstration and got a smile on his face. After the demonstration, Gerry returned the control to the showroom.

As Gerry walked back into the shop, Clem spoke up. "Guys, before we get started for the day I want to show you something." Clem held up a book on Solder. "This book came from Kester Solder and I have been going through it the past couple of evenings. In our line of work, we absolutely depend on being able to use solder effectively and we do it so much, we sort of take it for granted. This book reminded me about some of the fundamentals and I figured it wouldn't hurt to review them since it very well could improve my workmanship." Art and Gerry nodded in agreement and leaned back on Gerry's bench as they stood. They could both see that Clem was 'warming up' to a lecture.

"Solder really is a marvelous substance that has proven to be invaluable for electronic work. Of course, solder predates electronics. Folks have been working on ways to join metals for hundreds of years if not centuries. The first method involved compression welding. Two pieces of hot metal would be pounded on an anvil to fuse them together and this technique has been used to make tools and weapons since the Bronze Age. Rivets were used to join dissimilar metals and many a Roman shield made use of rivets. Of course, rivets were used to

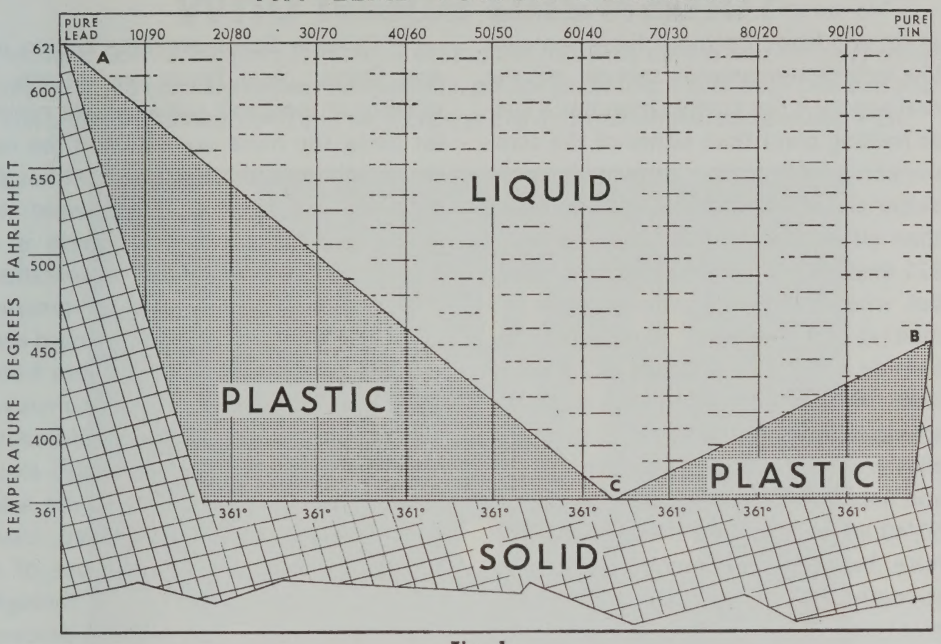


Fig. 1
The Tin-Lead Fusion Diagram

hold the knight's suits of armor together as well.

"The industrial age and the invention of steel from iron introduced the ability to actually weld metals. Welding is where the base metal is actually melted to form a strong joint. About the same time, it was discovered that bronze would form a strong chemical and mechanical bond with steel if the steel were heated to a red glow, around 1500 degrees F, and molten bronze applied. This process lead to what we call brazing. The advantage of brazing is that it can be done at lower temperatures and, thus, would not damage the steel or iron bits to be joined. The technique worked with noble metals as well and would come to be used by jewelry makers.

"Tinsmiths discovered that tin coated steel could be joined with solder. The advantage of solder is that it makes a strong chemical and mechanical bond at a much lower temperature than welding. In fact, tinsmiths could use an alcohol lamp with a tube to blow and direct the flame. The process was very similar to brazing, but at a much lower temperature and these days, the distinction between soldering and brazing is a matter of temperature. Over 1000 degrees, it is brazing and under is usually considered soldering. Of course, brazing is much stronger than soldering but that doesn't mean that a soldered joint can't be plenty strong enough as the tinsmiths discovered.

"For our purposes, the beauty of solder is that strong chemical and mechanical bond also makes an extraordinarily good electrical connection. Also for our benefit, that bond with solder works with steel, copper, brass and bronze – the metals used in radio construction. Plus, the melting point of solder is comparatively low so the process

doesn't damage the stuff we work with.

"As we all know, solder is a mixture of tin and lead. Both are fairly common low melting temperature metals. But the real beauty is the combination has a lower melting point than either of the components. Plus, the combination has better physical qualities for our purposes than either component. Lead melts at 621 degrees and tin melts at 450 degrees but what is called a eutectic alloy will melt at 361 degrees. A eutectic alloy consists of 63 percent tin and 37 percent lead. As it turns out, this is nearly the strongest alloy as well. The strongest alloy is about 55/45 or 55 percent tin. As you know, most of the solder we use is 60/40 which is a very effective compromise between low melting point and strength. With 60/40, between 321 degrees and about 370 degrees the solder is neither solid nor liquid – it is in a plastic state and we all have noticed what happens if a joint is moved while the solder is cooling through this temperature.

"Of course, to get the benefit of the strong bond solder makes, the surface we are soldering MUST be free of oxides since solder can't bond to the oxides and that is where the flux comes in. Solder flux will dissolve the surface oxides and literally float them to the top such that the molten solder can flow in underneath and bond with the surface. When we get it right, the solder will wet the surface and make a smooth and shiny connection. The layer of solder will protect the joint from oxidation and a wide range of chemicals that could cause corrosion. If the solder doesn't wet the surface, it will not flow into it and will not make a good connection. The joint will be subject to oxidation and corrosion.

"So, flux is extremely critical to the process. There are a number of materials that can be used for flux, but the most common are Chloride, Organic and Rosin or Resin.

"Chloride fluxes are also known as acid fluxes. Acid fluxes are actually a mixture of inorganic salts and are noted for being the most aggressive in the removal of surface oxidation. Although they are very good at the required removal of surface oxidation, there is a problem. When the soldering operation is complete, the flux residue will remain. Initially the residue will be quite hard and dry but it quickly absorbs moisture from the air. The resultant film is corrosive and will start to attack the metal underneath and the resultant film is also electrically conductive. Thus, if you use acid flux, the residue MUST be removed. Usually the removal requires the use of a blast of steam followed by a through clear water wash. This removal process is quite acceptable if you are repairing an auto radiator, but for radio repair it is inconvenient at best and destructive at worst. That is why we always say; never use acid flux.

"Organic fluxes are composed of mild acids or bases and are not as aggressive as the Chloride fluxes. The heat of soldering will cause them to decompose into volatiles and a sort of ash. The solid residue must be removed because, like the Chloride residue, it will absorb moisture and become corrosive. There are some organic fluxes that contain aliphatic or what is known as fatty acids. These are not so corrosive but leave a greasy, sticky residue that can be hard to remove.

"Rosin or Resin fluxes have some unique and highly desirable properties. Although not quite as aggressive at removing oxidation, they are still quite good at dissolving and carrying off surface oxidation. However, once they cool,

(Continued on page 16)

Who Made this Radio?

Member Don Pehlke from El Passo, IL sent us the following photos and the story behind them. If you can help answer his question, please get in touch with both Don and your editor (enzer@binsys.com) and we'll publish any information you can provide. —Ed.

I've been collecting antique radios since I was 17 when my old neighbor gave me a Zenith 10S155. I recently retired and moved to the country where I have enough land to build a shop and get the radios off crowded shelves and on display. As I put the radios out, I look them up, document them in an Excel database, and label them on display. The attached pictures are of one radio I can't find out any information.

I bought the radio at a local flea market, the seller insisted it is a prototype. I think it looks like a manufactured radio, but I can't figure out what make, model and year it is. The only identification is on the label on the back of the chassis that says W"W.M. Co."

Any help you or the other MARC members can give me would be greatly appreciated. I live in central Illinois, but I have been coming up to the MARC Extravaganza since the '90's, I know the first few trips I-69 was not complete and I drove the Lansing road. I sold a bunch of stuff at the last Extravaganza in Kalamazoo this past summer.

Thanks,
Don Pehlke (don.pehlke@gmail.com)

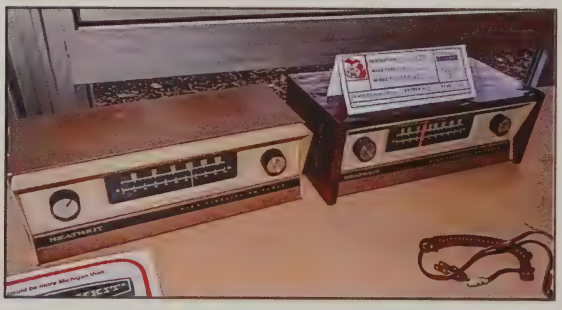
Farmington Hills Winter Meet

First place in the Ugly Radios category went to John Reinicke's very ugly 1929 Atwater Kent 53.

Lowell Muehlbrandt's weird Disney PF300ACR won second place in Ugly Radios.

This 1938 Wilcox Gay A52 won first place in Michigan Radios for Craig Brown.

A trio of model 218 Detrola Pee Wee's from 1939 owned by Lowell Muehlbrandt received second place in the Michigan category.



Third place in Michigan Radios went to John Reinicke's Heathkit AJ-53 and AJ-63 tuners from 1965.

This beautiful c1925 AC Dayton XL-25 with Tower Speaker won the Open for John Reinicke.

Bill Simon's rare Zenith Twin Seven from 1949 received second place in the Open.

Third place in the Open went to a home-brew amplifier build by Ian Shackleford.

A 1934 Sears Model 7091 Table Radio

By Edward Dupart

This is about a table radio, a real table radio that one can put a light on, candy dish, etc., a real piece of furniture.

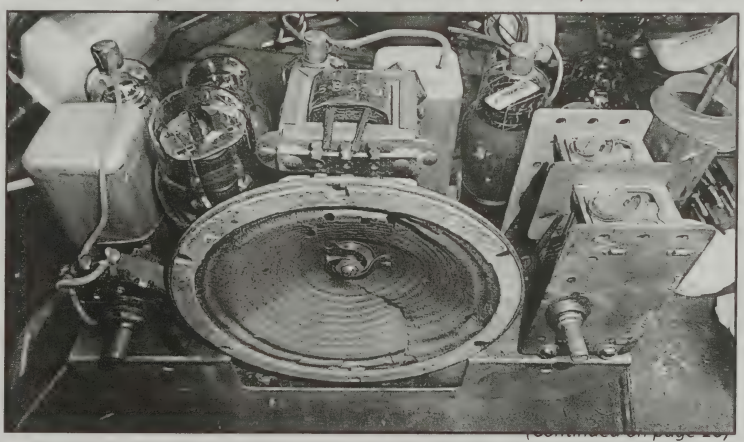
In the early 1970's most of my family left Detroit and my brother was one of them. He and the factory he worked for as an engineer moved from Detroit to Waco, Texas and my wife's sister and husband also decided to relocate from Muncie, Indiana to Irving, Texas. As a result we have a lot of family in Texas and we usually like to make one trip down there, especially during the colder months. Over the years we have developed favorite routes to take and if I can find one with good roads that bypasses freeways, then I will try it. I have discovered that a lot of major highways across the nation are in better shape than the freeways and I don't have all the trucks to contend with. One of our favorite routes goes through Tyler, Texas and east of there are a few antique shops I like to stop at. My wife would just as soon I bypass them, but I stop anyway and usually I find something interesting. This one antique shop has all kinds of antiques and I usually find something there. One year I bought a candlestick phone and a metal horn from the twenties and brought them home. Another year I bought a Paragon amplifier from the twenties and this past year I saw an interesting, small table. I went over and looked at it and the front panel was open and lo and behold, it was a radio! It was missing one knob and the top was a mess, but otherwise it was complete. The price was right, so I bought it and even my wife liked it. So into the truck it went and now I was anxious to get back home to check it out.

When we got home I pulled the little table radio out of the truck and looked it over carefully. The finish was still good

and inside the pull down panel it was excellent and looked like new. The top was a different story. Somebody tried to refinish the top and looked bumpy, dirty and nasty and there was a small piece of veneer missing. There was an original back made of wood that was in good condition and so I removed it so I could get at the chassis and remove it. There are two switches at the back of the chassis, one for AM/SW and one for AC/DC and there was an original knob on the AC/DC switch that matches the knob on the front. So that knob will replace the missing knob on the front and a generic knob will go on the back switch. Upon removing the chassis I discovered one cracked tube, but otherwise, the chassis looked good and hadn't been tampered with other than the filter capacitors being replaced decades ago. So, this should be an easy restoration project.

I tackled the top first and instead of using a chemical stripper, sandpaper was used and it removed the old finish quickly. Many times sandpaper will remove an old finish just as quickly and sometimes quicker than a chemical stripper and I really hate using a lot of chemicals. The veneer near the sliver of missing veneer was loose, so I glued the veneer down and found some veneer that would match the top. Once the glue on the top had dried and the excess removed, I took a piece of paper and laid it over the top and made a pencil outline of the place where the new veneer will go. The side of the pencil was used to make a pencil rubbing that shows up the lines of the edges of the veneer on the top and the edges of the top. That paper is then glued on top of the new veneer and when the glue dries a sharp blade, X-ACTO knife, razor blade, box cutter, etc. is used to cut out the replacement piece of veneer. Once the veneer is cut out it can be placed in its slot/spot and make sure it fits properly and do any necessary trimming. The coloration between the sliver of replacement veneer and the rest of the top was slightly different, so I used some stain on the replacement piece to get it to match the rest of the top. Then I glued it in place with ¼"-1/2" metal on top and C-clamped down. The metal on top ensures that it dries flat. I let it dry for a day, and then I remove the C-clamps and metal and do finish sanding. Usually I use lacquer, but I decided to brush on polyurethane. Polyurethane resists spilled drinks, water and is a tough finish. Also brushing it on reduces fumes from spray on finishes. Brushing goes on thicker, so it fills the grain faster and I find three coats is sufficient. I sand in-between the coats with #400 wet/dry sandpaper and I follow up with white polishing compound. When I get done it has a glass smooth finish.

The rest of the table just needed a good cleaning and I used 409 for that job. There were some scratches and instead of using Old English, which doesn't last long, a dark stain was used. This permanently fills in the scratches, but I had to



(Continued on page 17)

remove the excess stain quickly so as not to stain the original finish. When done, the scratches are about invisible. At this point the cabinet is done and now to move onto the chassis.

The chassis was dirty, but not rusty so I did a basic cleaning with a toothbrush and WD-40, making sure I didn't get any WD-40 in the tube sockets. I used the WD-40 to lubricate and clean the bearings in the tuning capacitor and the volume control. WD-40 is great for loosening up old grease making it easier to remove it, but WD-40 isn't a lasting lubricant so I use a 3n1 oil to lubricate the bearings in the tuning capacitor and the shaft on the volume control for a lasting lubrication. WD-40 can cause arcing in tube sockets, especially in the rectifier and output tube sockets where there is a lot of high voltage, if the WD-40 hasn't dried out sufficiently. So I use a greaseless cleaner for tube sockets and band switches. After cleaning the chassis I replaced the cracked 25Z5 and checked the rest of the tubes, which checked good and were original. Then I replaced the capacitors and checked the resistance line cord, which was still good, but the decorative outside cloth was missing in spots, but it was still useable. I plugged it in and the radio worked! I decided to replace the resistance line cord with a diode in series with the filaments, which is good for a 25-volt drop and an external -dropping resistor. By using the diode, the dropping resistor required will be of less resistance and will run cooler. I found a 50-watt resistor that I mounted on the back of the chassis and it runs quite cool. The AC/DC switch was intermittent in operation so I wired it for AC only. I don't know of any place in the nation that uses DC anymore. The shortwave, 1.6-4mHz, works, but it is a cheap circuit that still allows strong AM stations to come through and there wasn't anything I could do about that. The speaker had a lot of tears in it, so I did a lot of gluing with a flexible rubber based glue. The speaker works, but it did lose some bass response because of the cone becoming stiffer. It should be reconed, but I didn't want to spend the money. I put it all back together and it works great.

This is now a nice useful radio that can have flowers or a light or anything else you want to put on top of it and it can be listened to. With the right music you can make the flowers happy.

(The Shop, continued from page 10)

Rosin or Resin fluxes become completely inert. The surface is hard and will not absorb moisture. More importantly, they are very good electrical insulators. These properties have been researched extensively and they remain inert forever under normal circumstances.

"The solder we use has the flux contained inside the solder wire which is actually a pipe with the flux inside. That is why the correct way to solder involves placing the soldering iron on the surface to be soldered and then introducing the solder between the iron and the surface. That way the flux comes in contact with the surface. If you put the solder on the iron, the solder will flow around by gravity, but the flux will not, so to get a good joint, you want to be sure the solder comes in contact with the heated surface.

"Flux does have one bad effect, no matter what type is used. Because flux depends on a corrosive action to remove the oxides, it will, with long exposure, erode the base material. This is not a

problem for the joints we make because the exposure is of short duration – usually only a few seconds. However, the tip of the soldering iron is exposed as long as it is hot and even a soldering gun is exposed to many encounters with flux. That is why we find ourselves filing the pits on the tips of soldering irons and replacing tips on soldering guns. I guess you could say that is just the cost of using the process. We have gotten some relief in that soldering iron manufacturers are working on steel clad tips that are much more durable.

"As good as solder is, there are some metals that simply can't be soldered. Aluminum is a prime example since there are no common fluxes that can deal with the surface oxidation. Solder is made of quite pure tin and lead and there are impurities that even in small quantities will pretty much ruin the solder. For example, quantities of Zinc as little as 0.001% will raise the melting point by a couple of hundred degrees and really mess up the crystalline structure. That is why you just can't solder galvanized steel. Cadmium will also mess things up and this is a concern for you guys that work with surplus equipment and its cadmium plated steel parts. Cad plating will greatly reduce corrosion, but it will also preclude soldering. Arsenic can also cause mischief, but fortunately we rarely encounter it. Antimony is also a bad actor and is only a concern if we are working around auto batteries. In pure lead, Antimony will improve the strength of lead and so it is used to make the plates of a car battery. It might turn up in cheap solder because the manufacturer might choose to use reclaimed lead.

"Silver was tried during the war as a substitute for tin since a lot of tin came from hostile countries. Silver will raise the melting point quite considerably. A mixture of 1.75% silver with 1% of tin in lead will make a solder that melts at 590 degrees that will produce acceptable joints with aggressive fluxes. This alloy does have one important use in that it can bond to ceramic surfaces, which has proven useful in the manufacture of some transmitting tubes that use ceramic rather than glass. It is a tricky process and if we try to solder to one of these surfaces, with our usual solder, the coating on the ceramic will quickly go into solution with our solder and ruin the bond."

From his expression, Clem could see the "light bulb go off" in Gerry's head. Gerry held up one finger. "Ah, that explains it! I found one of those coated ceramic things in some surplus gear and it appeared to be soldered. A connection had broken and the more I tried to re-solder it, the worse it got. Now I know I was using the wrong stuff and probably couldn't get it if I tried."

Clem added, "I think you will find the same issue if you try to re-solder a lead on a ceramic capacitor. Fortunately, unless one is really careless, leads don't often pull off the face of a cap."

The sound of the back door opening caused all of them to turn toward the door. Two of Art's classmates from high school, Fred and George, were walking in. Fred and George were linemen on the football team. Art knew they had little interest in electrical stuff even if George was a bit of a wiz at math, so he was surprised to see them in the shop. Clem got a big grin on his face. "Hi guys! You are right on time." Clem then turned to his two nonplused employees. "I hired these guys to help me with a project. They helped out yesterday and the second part is today. This time, I think it might take all of us as well. It is over in the barn, so shall we proceed." Clem ges-

tured toward the door and led the troop out the door and across the alley to the barn. Art and Gerry brought up the rear and were looking at each other, both shaking their heads to indicate, "No, I don't know what is up."

Clem led them to the back of his service van and opened the back doors. Art and Gerry stared into the back of the van at a really quite large piece of furniture. The mahogany veneer gleamed on a cabinet that was three feet wide, four feet high and just short of two feet deep. The top portion had closed tambour doors. The mid portion had what appeared to be massive drawers with book matched veneer. The bottom portion had two curved, book matched, panels leading to a speaker grill. It was huge and clearly some sort of home entertainment equipment. Clem could see the looks on Art and Gerry's face. "Believe it or not, that is a television-radio combination. It is an RCA 648PTK set and it weighs 295 pounds as you see it there and that is why I hired some extra muscle to get it in the van yesterday and why I thought it would take all of us today. I want to put it in the back, next to the old machine shop to get it out of the way. We are going to put it up on blocks to keep it off the floor and I expect it will take all of us to do that."

Clem's prediction proved correct. It did take all of them to hoist it out of the van. Even with a hand truck, it's large size made maneuvering it in the barn tricky. Once it was in place, the four younger men hoisted it off the floor and Clem slipped four sizable blocks of treated lumber under the feet at each corner. Fred and George gave a friendly wave and headed out. Art and Gerry stood and looked at it. Art walked around studying the back and then the front. He opened the tambour doors and discovered a flat screen of frosted glass that measured 15 inches high by 20 inches wide. He shook his head slowly and said under his breath, "Wow, that is kind of a big screen."

Gerry turned to Clem. "So, boss, what is the story and what do you plan to do with it?"

Clem, always ready to explain, responded with a grin. "That came from Doc Jordan's place. I sold that to him back early in '48. The good doctor has always wanted to be the first to have the best he can buy. That set has a total of 48 tubes. The radio uses 12 of them leaving the television with a very impressive count of 36 tubes. The radio is AM, FM and short wave and features push-pull output for the audio. In terms of radio and television performance, it just didn't get any better than that in 1948, and even today, it is quite impressive. Art, you are correct, that is a big screen. That set uses a 5-inch picture tube with the face of the screen mounted at the focal point of a Cassegrain projection

system. The face of the picture tube faces down into a first surface spherical mirror and the picture is beamed off that mirror through a correction lens surrounding the picture tube to another first surface mirror mounted at 45 degrees behind the screen. It made for the biggest picture you could get in those days. For those of you into photography, it is an f8 system, so it is quite bright.

"The good doctor paid well over a grand in those days which is even more impressive if you consider there was only one station that could be received on a regular basis and that took an antenna on a tall tower to boot. As I said, that was a good as TV got in the day and Doc Jordan was sort of a TV DX aficionado. He would stop in the shop to brag about stations he had logged.

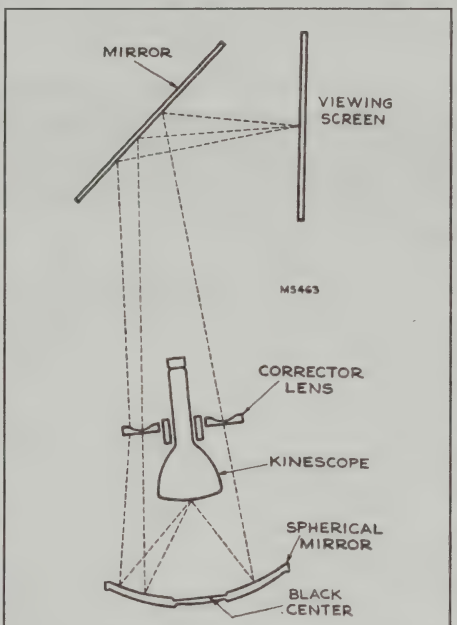


Figure 16—Reflective Optical System

"Of course, these days, color television is available and Doc Jordan still has to be among the first. So I took this in trade for a new color set. He didn't mind at all that I couldn't offer much in trade - he just wanted the latest."

Gerry grinned. "Sounds about right, there are only a couple of color shows and it still takes a big tower. At least we now get three stations on a regular basis and fringe coverage on three more."

Art had walked around behind the massive cabinet and was studying the collection of chassis and the optic system. Clem caught him pointing as he counted. "Am I counting right, does this set have four rectifier tubes?"

Clem responded, "Well, actually it is seven." Clem paused to let it sink in and then continued before Art could respond. "There are the four tubes for B plus that you counted and three more as high Voltage rectifiers. Those three are connected in a tripler cascade to put close to 30 KV on the picture tube. There are three power transformers. One is for the radio. The second is for the television receiver functions and the vertical deflection. The third is for the horizontal deflection. Because the picture tube takes so much current, the horizontal deflection gets its own power supply. Also, if you look, you will see there are two horizontal output tubes in parallel. The B plus for the Horizontal chassis is almost 500 Volts and that takes two 5U4s in parallel. Quite aside from the massive size, that is why I really don't like working on that set. There are Voltages with sufficient 'oomph' to do serious harm if you don't pay attention."

Gerry had been looking over Art's shoulder as he studied the back. He was clearly impressed. "As I said before, what are you going to do with it?"

Clem had a bemused look on his face. "Frankly, Gerry, I don't have a clue. For starters, that set has a bad picture tube. It also has enough hours that there

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(The Shop, continued from page 19)

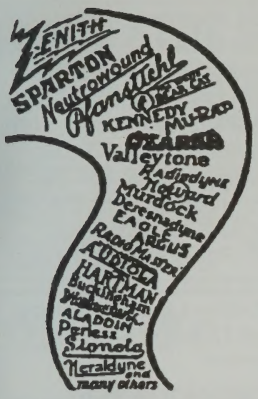
will be bad chassis tubes as well. I checked and the picture tube is still available at a list price of 60 bucks. Our cost would be 45 bucks which makes it a fairly expensive tube. When you replace the tube you have to clean and adjust the optics. As I am sure you know, there are required techniques to clean those first surface mirrors. I wouldn't be surprised if it took over a C note and a lot of time to get it up to snuff. That makes it hard to make money on the effort. I don't know how many people have a living room big enough to accommodate that much furniture.

"I may get it going and put it on display in the showroom but I don't know if I want to give up that much display space for a novelty. It is a beautiful thing, but its time has passed. The radio and speaker would make a great Hi Fi set if you added a record changer, but that would mess up that fantastic cabinet. So I think for the moment, I will cover it up with a movers blanket until I can figure out its fate."

The three of them covered it with a blanket and walked back across the alley. As they walked they each tried to come up with imaginative things to do with it.

I sat back in my chair and thought about the television set and couldn't help but wonder what had happed to it. I also noted that my coffee had gone cold and decided it was time to step downstairs to warm up the cup and myself.

Authors note: I want to extend thanks to Mark Oppat who provided a copy of "Solder ... its fundamentals and usage" from the Kester Solder Company. If you happen on one of these at a flea market I would recommend giving it a read.



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REPAIR SERVICE: I repair old tube type radios. Have stock of old type tubes and parts. Paul Colosimo, 19111 Wood St., Melvindale, MI 48122. 313-928-3780, 313-928-3322 (office).

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FOR SALE: ARBE-III, Universal Battery Eliminator, $159.95 + $15 S/H. Michigan residents, please add $9.00 sales tax. The ARBE-III is designed to provide the power requirements for most pre 1930's battery operated radios. The custom wound power transformer provides 3 electrically isolated supplies (A, B, C) which are all regulated and short circuit proof. Comes assembled, tested and with a full five year warranty. Please refer to our website at www.arbeiii.com for direct purchase using PayPal. You can contact me at 517-787-2985 for details on money order or personal check payments. We are also offering custom wound audio transformers for early radios. $19 each or $20 each for the center tapped version plus S/H. See our website for other items offered. You can reach me at arbeiii@yahoo.com.

FOR SALE: PARTS! We have a full stock of radio supplies, including capacitors, tubes, knobs (including our two types of real wood repros!) , bulbs, tube shields, etc. Our two specialties: repro radio dials (we bought the former Clint Blais repro dial business in 2003, and they are still the best!) and we can duplicate or repair most old volume or tone controls. Phono needles, carts and wheels too. Email any wants or see our website at www.oldradioparts.net Over 30 years servicing radios here! Mark Oppat mop-pat@comcast.net 253 Blanche St, Plymouth, MI 48170 734-455-4169 11am-9pm most days.

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FREE: Heathkit GR 2000 television set. This is the ultimate Heathkit TV from 1979 and it was working when I parked it. It does not have a cabinet. I will also include a spare CRT. Just pick it up and it is all yours. Located in the Detroit metro area call or text me at 248 202 2175. John Reinicke

WANTED: Reuben Smith 5-tube TRF battery radio manufactured in Lansing, MI circa 1925. I traded this radio off to Oran Sauder (RIP) maybe 20 years ago. My radio had a glass front panel as well. Any assistance in relocating this radio for my personal collection would be greatly appreciated. Jim Clark, 517-648-2785 or jc072651@aol.com. Thank you.

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FREE: RCA "New Vista" color TV, Model CL 670 F, chassis no. 14 crc 38 XT, CRT no. 25XP22. It's an all-tube chassis with a Nuvistor front end. Good condition except for moisture damage on bottom of legs. I can e-mail photos. Located in Bay City. Contact me by e-mail, ccampbell1873@charter.net, or by phone, 231-944-9044. Chris Campbell.

Soon to be Homeless Orphans: I no longer have room for, and am offering up for FREE this COMPLETE lot of radios consisting of: 1) Admiral portable, Model 227, Chassis 6S2. 1) RCA Victor portable, Model 1-T-5J. 1) RCA AM FM table radio, RZC 915 W-K. 1) Detrola table radio, Chassis model 571. 1) GE table radio, Model T-2260H. 1) Magnavox, FM 16 1 Blonde. 1) "Approved Hi- Fi Tuner 12" with three separate chassis, mounted in wood box with speaker. 1) 1950's Car radio, tube type with 110 volt power supply, mounted in wood box with antenna and speaker. **The conditions of these radios vary from good to poor.** Please email Steve at rt2001strat@att.net for photos or other details. As stated above I prefer to divest of these as the COMPLETE lot for FREE at one time, and NOT individually. If you are interested in certain units, I am open to cash offers.

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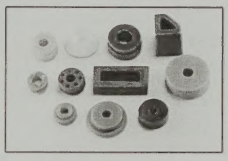

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